

OBSERVATIONS ON CHANGE IN STRUCTURE OF A LARVA OF DRYOCAMPA IMPERIALIS.

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I desire to call the attention of the Academy to some important structural changes in a larva of *Dryocampa imperialis*, which came under my observation during the early part of last August, as they show sufficient reasons, in my opinion, for the withdrawal of the *imperialis* of Drury, from the new genus of *Dryocampa*, and its reinstatement in the old one of *Ceratocampa*. Besides, they afford additional proofs to the many which have already been noticed by naturalists, of the incompetency of Darwin's theory of natural selection in every case, to account for the origin of species, by minute, indefinite, fortuitous variations, without the aid of other and more important causes.

In this vicinity, during the last four years, I have found the larva of *Dryocampa imperialis* feeding principally upon the leaves of *Juniperus communis* and *J. Virginiana*, and occasionally upon some few species of *Pinus*; but prior to the above time, so far as I have been able to determine, it has never been observed feeding upon the various species of *Juglans*, etc., in company with the larva of *C. regalis*.

At the time above mentioned I found the larva of what I supposed to be the *C. regalis* feeding on an English walnut. I felt no little surprise at the unusual appearance which it presented, and I was at first somewhat dubious, whether to refer it to *C. regalis* or *D. imperialis*, as it contained marked characters of both. If it had been in one of its earliest stages, it would not have excited wonder since the young of the two bear such a close resemblance to each other; but this specimen had attained the period of its final change. In size, color, and the nearly equal development of the spinous projections of the dorsal surface of the thoracic segments, it agreed with *C. regalis*; in the diminutiveness of the abdominal projections, and in the moderately sized hairs which rather closely invested the worm upon the superior and lateral surfaces, it agreed with *D. imperialis*. I might add that the chrysalis approximates the genus *Ceratocampa* in general appearance, and in the conformation of the terminal appendage or spine, more nearly than *Dryocampa*.

These characters would seem to imply a case of hybridism, but I think differently. Having raised scores of the males and females of both species in the same box, I have never observed a single irregular union—the males of both invariably seeking their own kind. So deeply is the sexual instinct implanted in them that the females, rather than submit to copulation with species essentially unlike, deposit their ova unfertilized. I am inclined to the belief that *C. regalis*, being a higher type of insect than *D. imperialis* had been evolved from the latter in obedience to internal changes brought about through the medium of nutrition; said changes having been moderately sudden instead of slow and gradual.

That nutrition plays such an important part in the evolution of species, may seem to be speculation, without facts to sustain it. If nutrition should be proved to be the means by which the sexes in insects are controlled, as a paper in "The American Naturalist," by Mrs. Mary Treat, would indicate, I cannot discern why it should not be applicable to a certain extent to the production of species.

In the case under consideration, the change from diet containing but a small percentage of nutritive matter, as leaves of conifers possess, to more nutritious food, has, in my estimation, been the agent in producing the changes above indicated. That these changes have not been going on for indefinite periods, but have been the work of a short time, I think is evident.

If, through the medium of nutrition, *D. imperialis* is brought to assume many of the prominent characters of *C. regalis*, I do not see the propriety of placing the former in a distinct genus from the latter, in consequence of a slight difference in the size of the antennæ, and in the position of the posterior wings in a state of rest in the adult state: as the close resemblance which obtains between the two larvæ when young, seems to imply a near relationship. Harris, in referring *D. imperialis*, of Drury to *Dryocampa*, did so under considerable hesitation. The fact that there is such a near alliance, backed up by those set forth in this paper, if they are rightly interpreted, would seem to warrant its reinstatement in the old genus *Ceratocampa*.